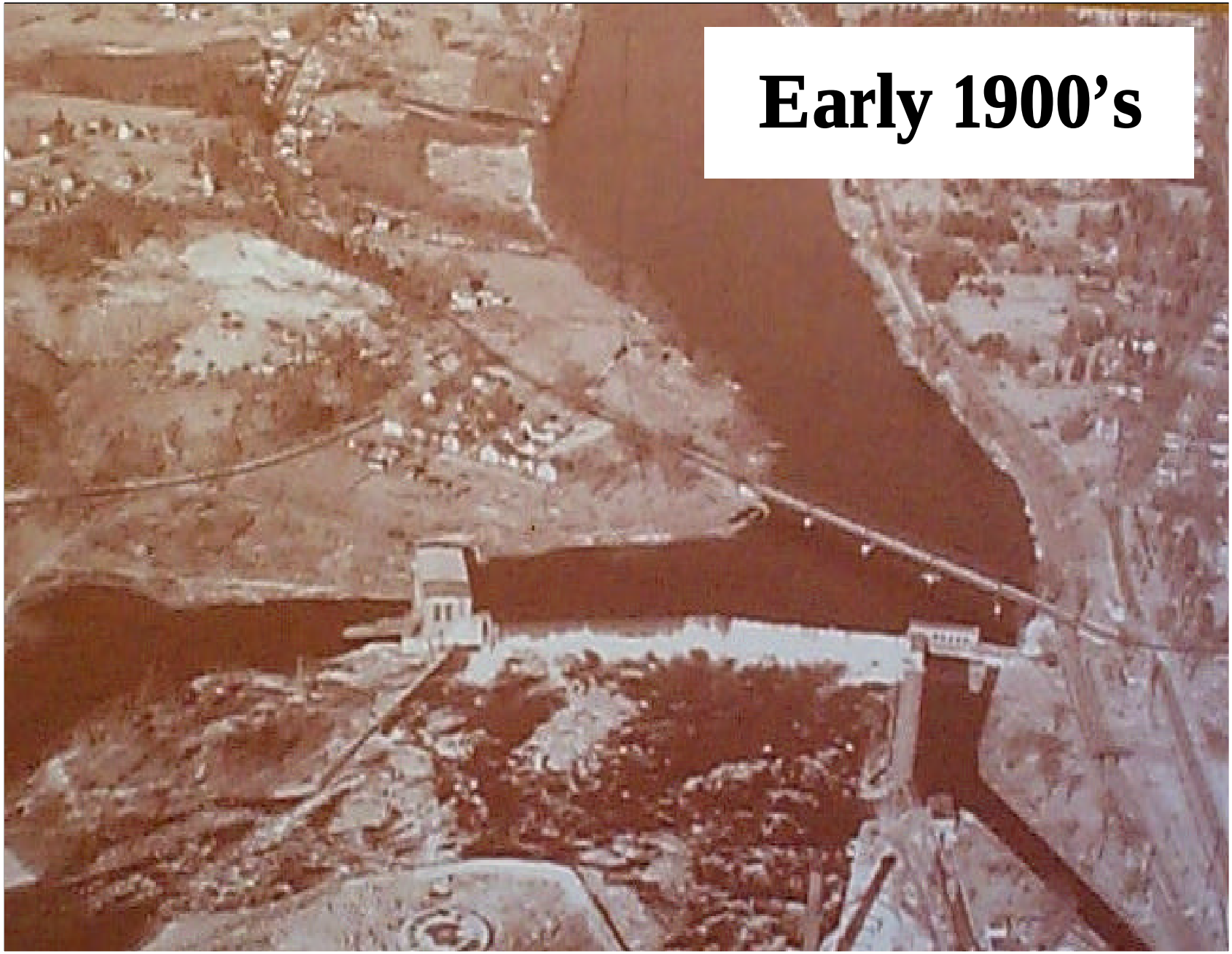
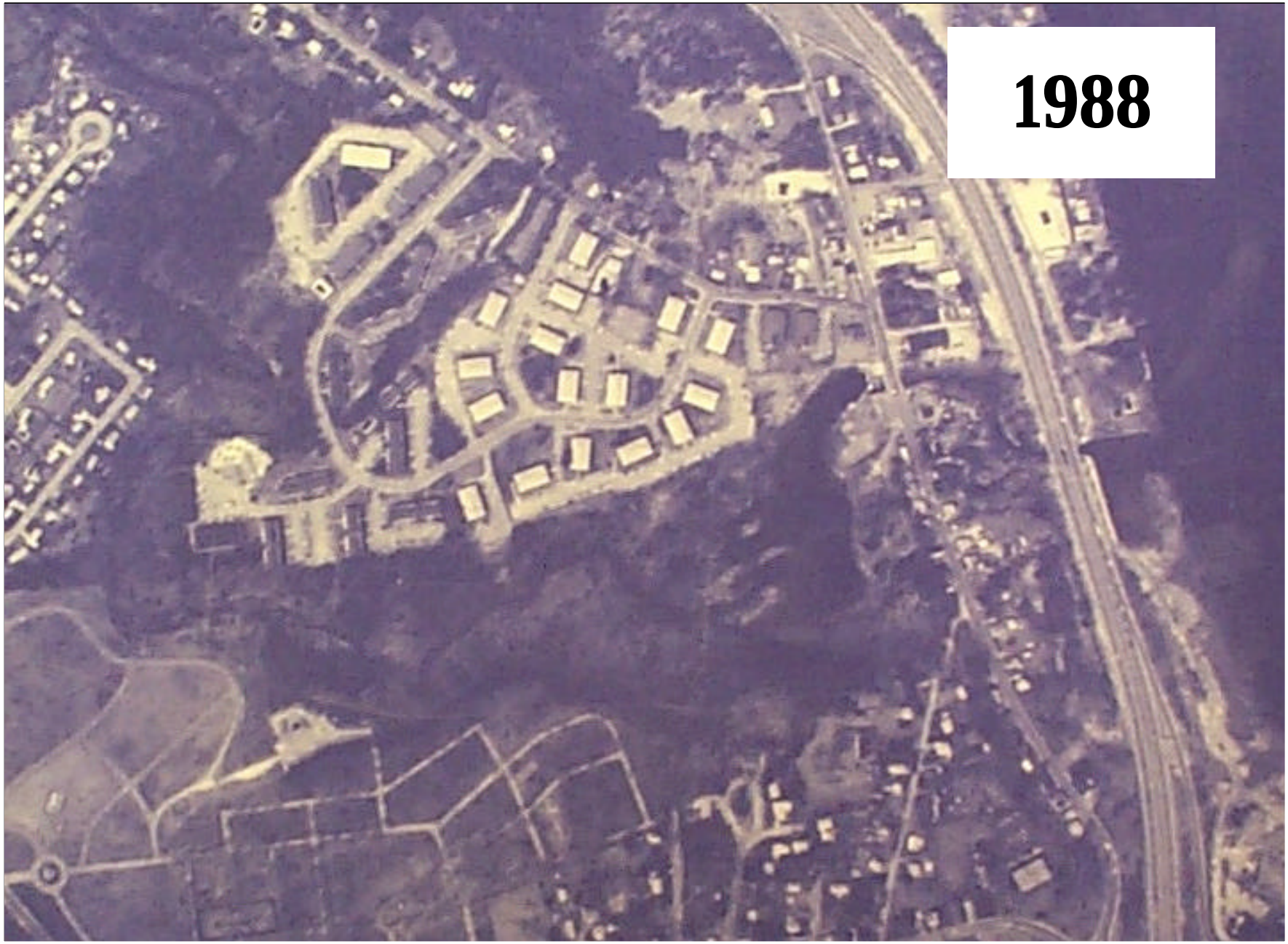
Maxwell Pond Dam
Public Informational Meeting
January 20, 2005

- Presentation
  - Current Condition of Dam, Pond & Brook
  - Options, Costs, & Funding Sources
  - Dam Removal & River Restoration Basics
  - Case Studies
  - Project Partners
- Decision Making To-Date & Next Steps
- Question & Answer Session
- Public Comment Session
- Adjourn


Early 1900's


1988

Maxwell “Pond” Aerial – Today

Current Condition of Dam & Need for a Decision: Dam is in Disrepair

- Letter of Deficiency
- Dam Safety Standards
- Need for a Decision

Sink Hole & Dam Leakage

Sink Hole – Beside Retaining Wall

Seepage – Base of Retaining Wall

Concrete Spalling – South Wall

Current Conditions of Black Brook and Maxwell Pond: Data Collection

Topographic & Sediment Surveys

Topographic & Sediment Surveys

1988

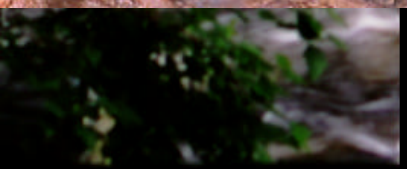
1998

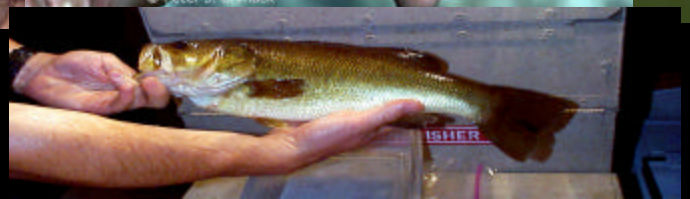
Fish Populations & Habitat Assessment

Fish Populations in Black Brook – Manchester, NH

Below Maxwell Pond Dam: 16 Species

- American eel
- Margined Madtom
- Brown Bullhead
- Longnose Dace
- Spottail Shiner
- Yellow Bullhead
- Smallmouth Bass
- Blacknose Dace
- Fallfish
- Pumpkinseed
- Largemouth Bass
- Redbreast Sunfish
- Bluegill
- Golden Shiner
- White Sucker
- Common Shiner





Fish Populations in Black Brook – Manchester, NH

Above Maxwell Pond Dam: 7 Species

- Fallfish
- Common Shiner
- Blacknose Dace
- Margined Madtom
- Longnose Dace
- Pumpkinseed
- Chain Pickerel

Options, Costs, & Funding Sources

Options, Costs, & Funding Sources

1. Dam Repair & Maintenance
2. Dredge Pond for Swimming
   - Assumes Dam Repair & Maintenance
3. Dam Removal
4. No Action (not really an option)

Option #1 – Dam Repair

Estimated Cost: $60,000.00

Funding Source: City Tax Revenue

Includes:

- Mobilization
- Sediment & Erosion Control
- Clearing & Grubbing
- Dam Embankment Excavation
- Repair Seepage Area
- South Concrete Wall Surface Repair
- Repair / Re-Point Portions of Wall
- Restoration (Loam, Seed, Mulch) Cleanup

Option #1 (Cont.) – Dam Maintenance

Estimated Cost (Annually): $5,500.00

Funding Source: City Tax Revenue

Includes:

- **Annual Maintenance**
- **Dam Inspection by NHDES**
- **Emergency Action Plan (EAP)**
- **Repair & Improvements**

20-Year Maintenance Cost = $110,000.00

(+ $60,000.00 Dam Repair Cost)

Option #2 – Dredge of Pond:

Estimated Cost: $1,300,000*

Funding Source: City Tax Revenue

Includes:

- 7.7 acres
- Maximum depth in 1950s was 8 feet
- Scalping edges, sloping area with mean depth of 3.5 feet
- Approximately 43,230 cubic yards
- $30 cubic yard
- Trucking and disposal of dredge spoils

*(Does not include dam repair and maintenance costs)

7.7 Acres of Dredging

Option #3 – Dam Removal

Estimated Cost: $50,000.00

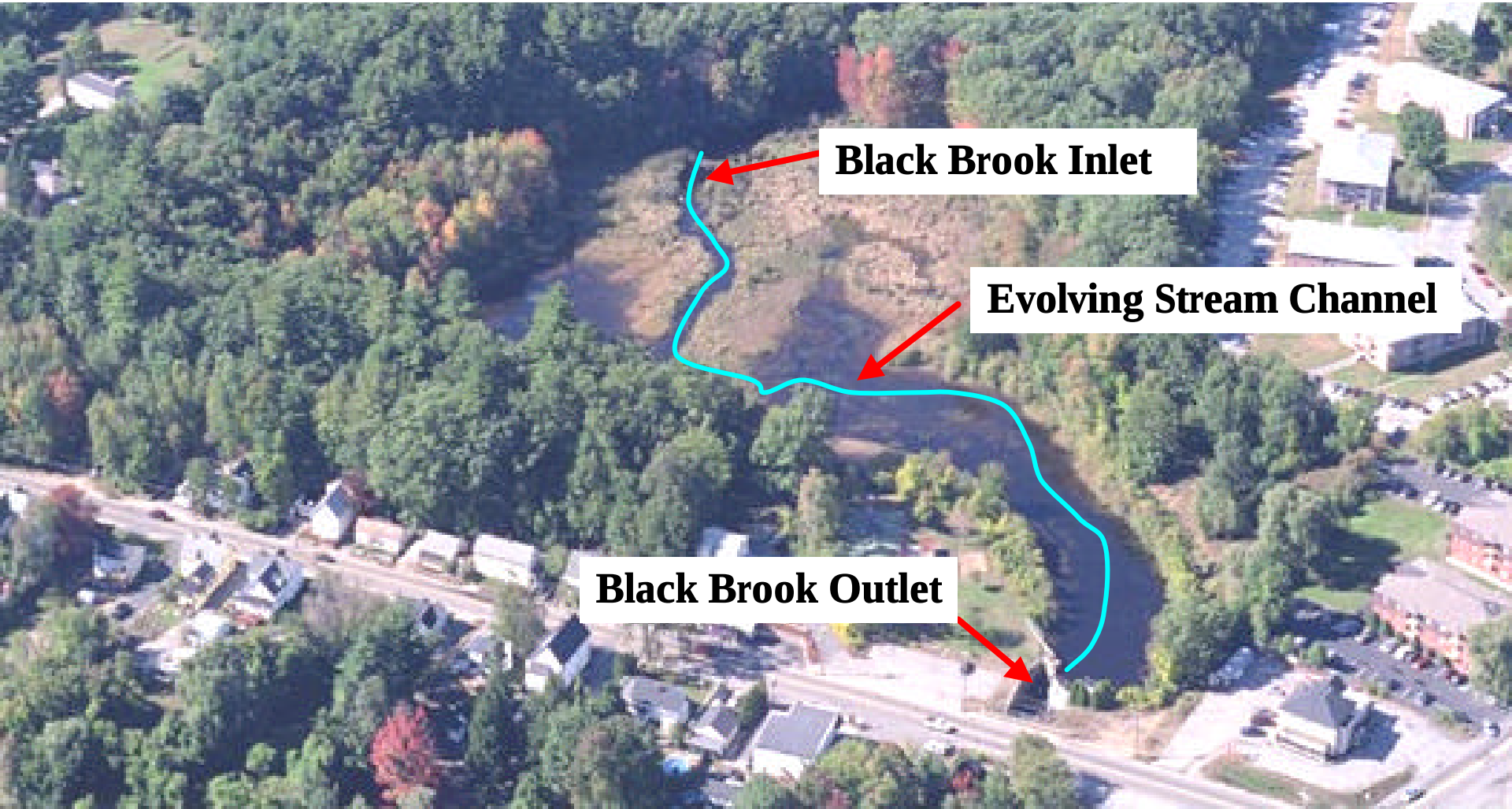
Funding Sources: Federal, UPRP, State & Foundation Grants

Includes:

- Planning / Engineering / Project Oversight
- Mobilization
- Demolition / Removal
- Demobilization / Restoration
- Equipment Costs
- Materials

Maxwell Pond Aerial – Today

Natural Stream Channel Evolution



Option #4 – No Action

Estimated Cost: $0.00

Funding Source: None required

Infeasible:

- Safety Concerns
- Letter of Deficiency
- Liability Issues

Option Summary

Option	Cost	Who Pays
1. Dam Removal & River Restoration	$50,000 One-time expense	Grants (State, UPRP Federal, Foundation)
2. Dam Repair & Maintenance	$60,000 Now (for repair); $5,500 Annually (for maintenance)	City Taxpayers
3. Dredging Pond	$1,300,000 (will need dam repair, maintenance dredge)	City Taxpayers

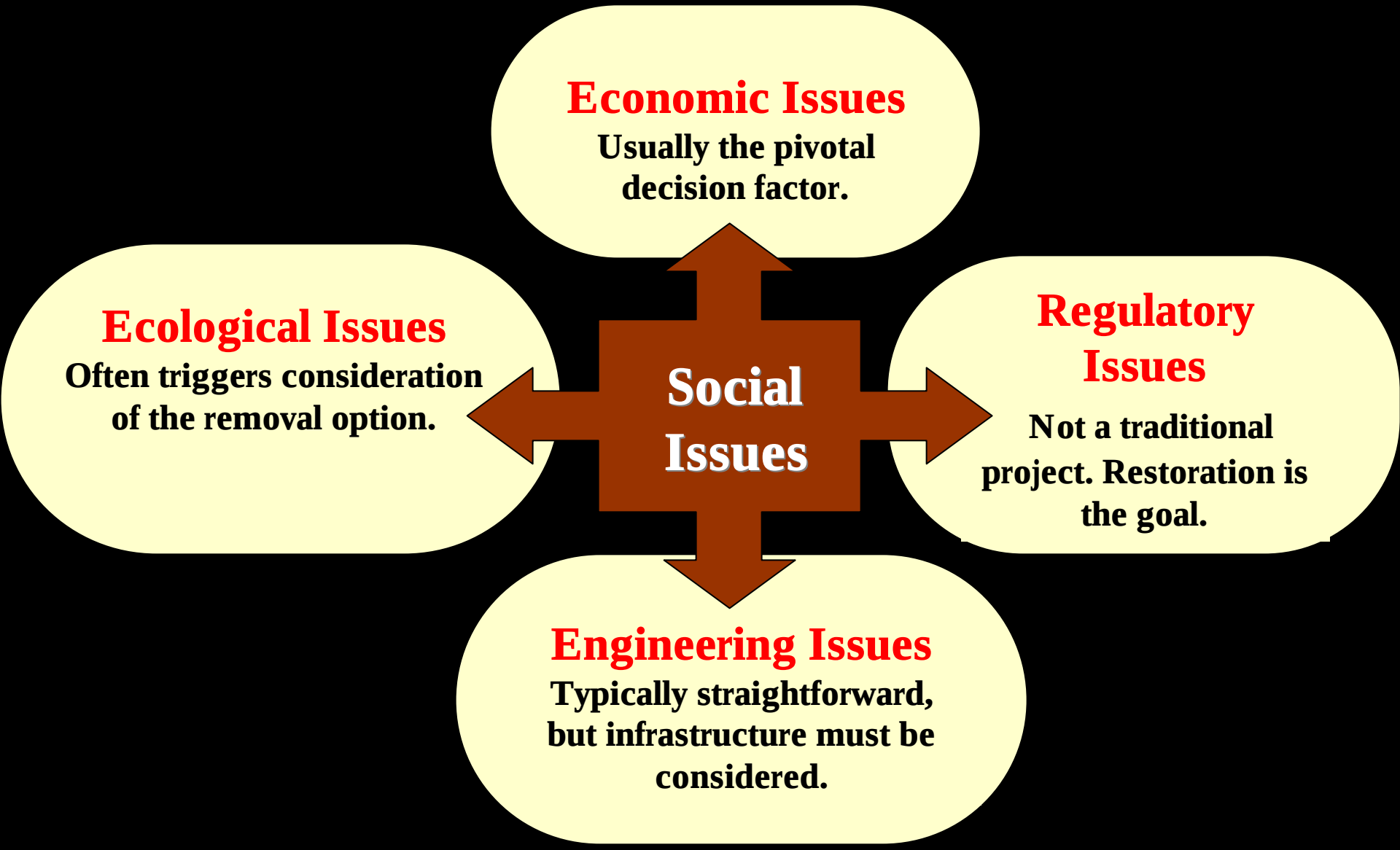
Why Are People Removing Dams?

Why Are People Removing Dams?

- Thousands of dams are at the end of their useful, safe and economical life

- Many pose liability risks to their owners
- Dams were often built with little consideration of their impact on river systems
- Free-flowing rivers play vital roles in terrestrial & aquatic ecosystem health
- There is a growing public appreciation for free-flowing rivers and a desire to restore them

Dam Removal: A Multidisciplinary Issue



Free-Flowing River at Dynamic Equilibrium

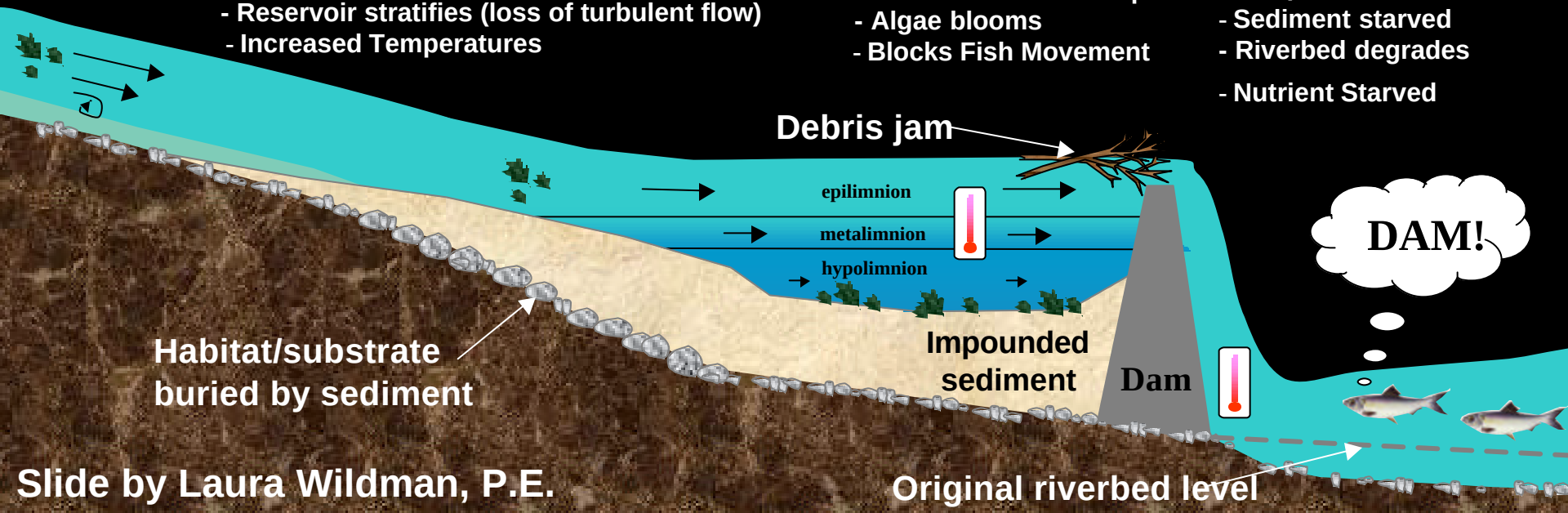
Impoundment

- Decreased water quality (decreased circulation)
- Pollutants accumulate (concentrate)
- Oxygen depletion (may become anoxic)
- Reservoir stratifies (loss of turbulent flow)
- Increased Temperatures

- Traps sediment
- Traps debris
- Blocks nutrient transport
- Algae blooms
- Blocks Fish Movement

Downstream

- Water quality is reduced
- Altered flow regime
- Temperatures modified
- Sediment starved
- Riverbed degrades
- Nutrient Starved



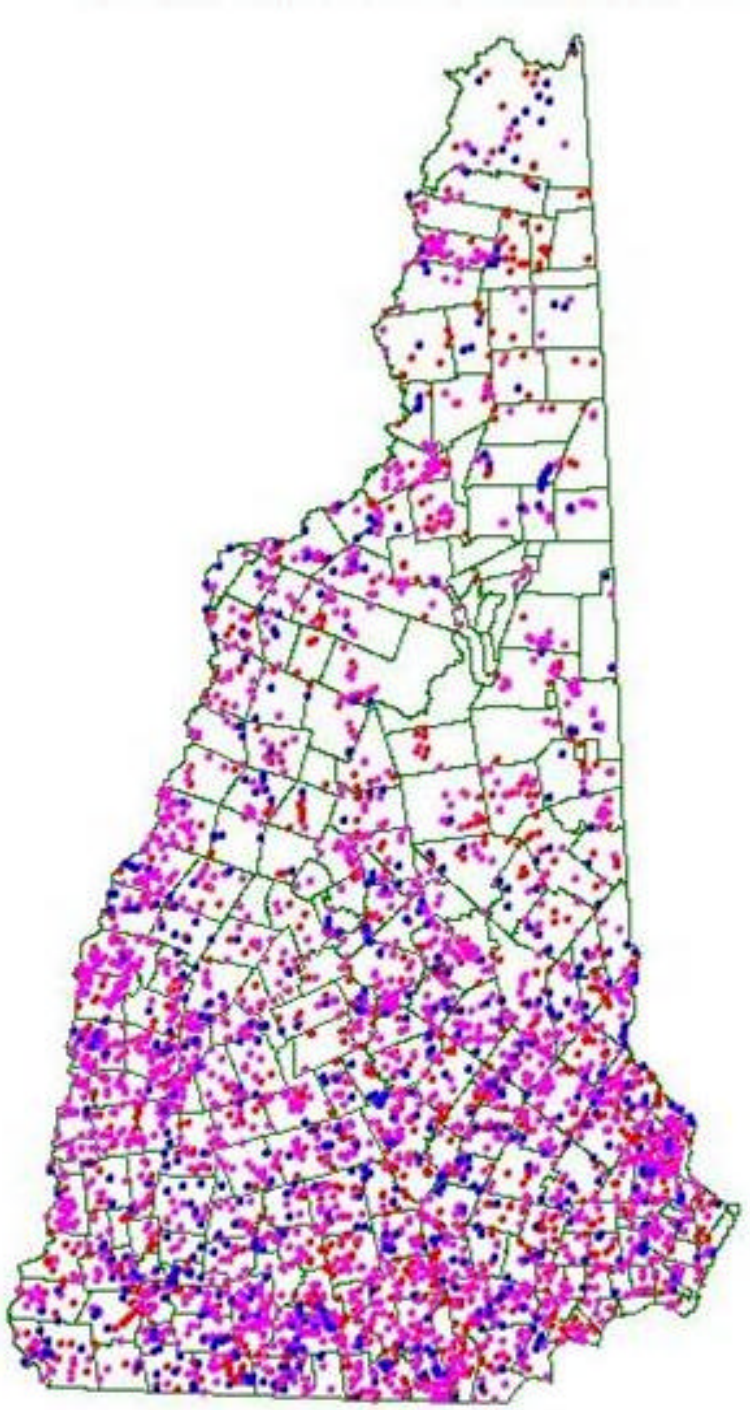
Slide by Laura Wildman, P.E.

How Many Dams are in New Hampshire?

National Inventory of Dams (NID) = 625

NID + Remaining Active Dams = 3,200

NID + Active + Inactive Dams = 4,866 dams in the state database



Environmental Services

What are the Functions of NH's Dams?

Use	Percent of Total Active Dams
Recreation	36
Stormwater detention pond	15
Conservation / agriculture	14
Other	12
Fire protection	8
Hydropower	5
Water supply	3
Flood control	2
Sewage lagoon	2

A default category that includes many old mill dams.

Very few currently produce or are capable of producing hydropower.

Even fewer provide flood control. In fact, many exacerbate flooding.

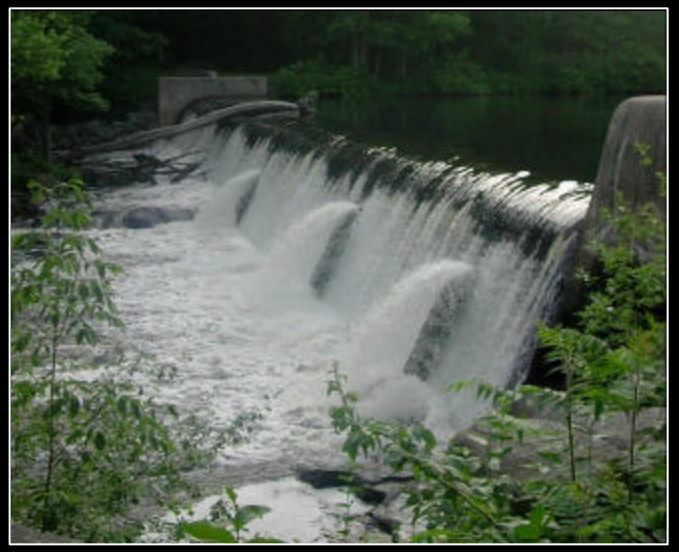
Ownership of Active Dams

Private = 80%

Municipal = 10%

State = 9%

Federal = 1%



Hazard Classifications

High hazard = 3 %

Significant = 6 %

Low = 16 %

Non-menace = 75 %

High & Significant Hazard Dam Ownership

35% - Privately Owned

32% - Municipally Owned

Dam Removal / River Restoration Case Studies

Bearcamp River Dam – South Tamworth

Removed September 2003

- **Removal cost estimate: $ 120,000 (w/ studies)**
- **Actual cost: $ 75,000 (w/ studies)**
- **Reconnected 28 miles of free-flowing river**

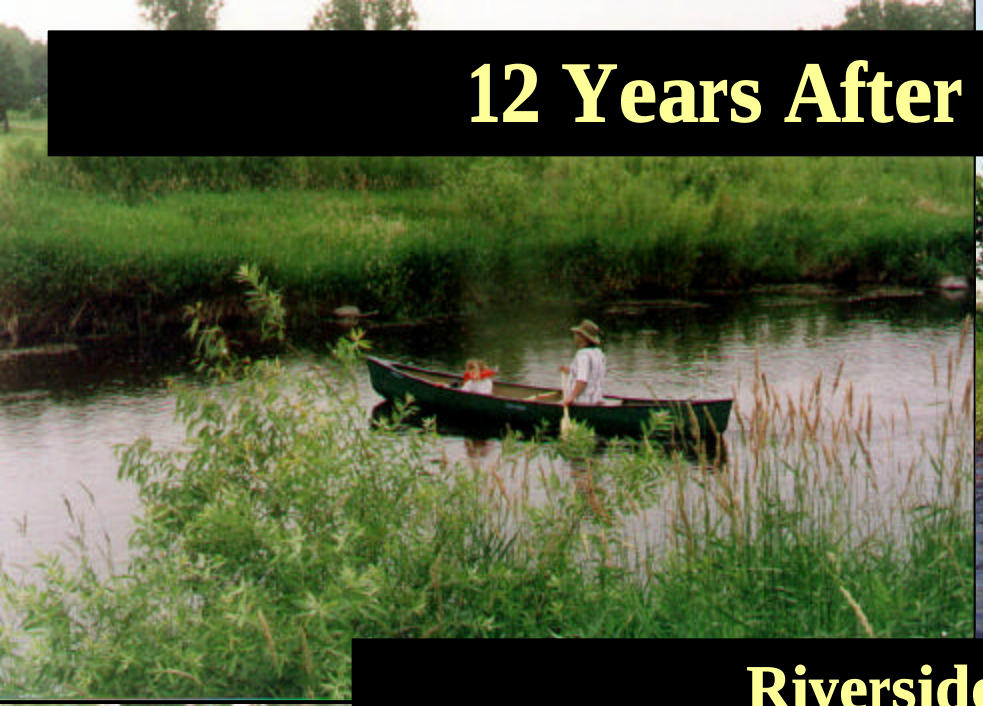
Before and 8 months after completion

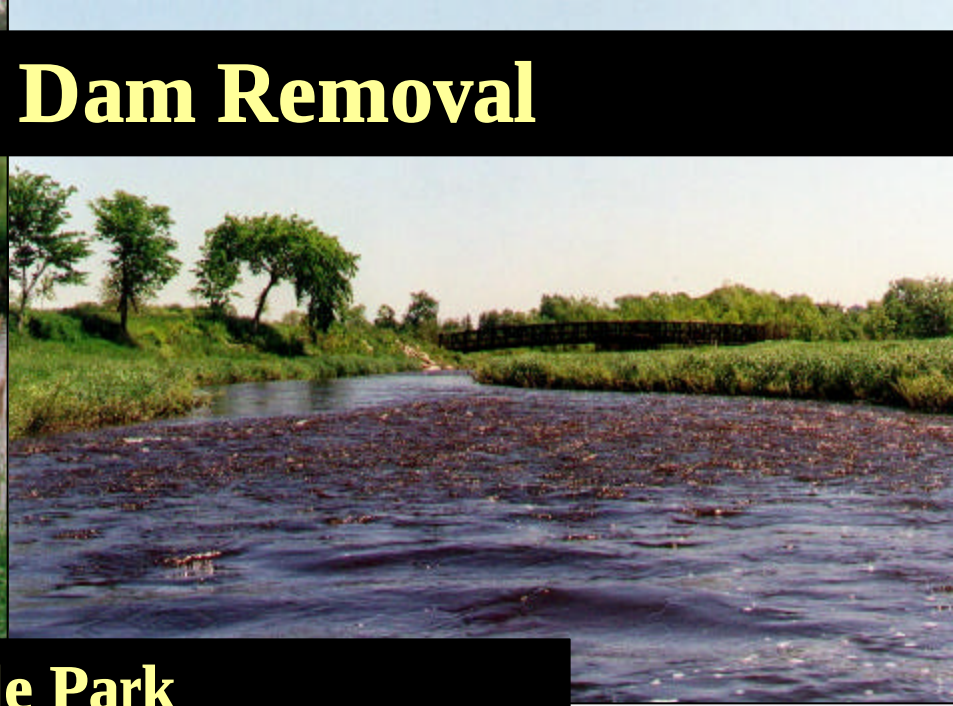
A Shared Community Vision of the Restored Resource is Critical!

Woolen Mills Dam,
Milwaukee River, West Bend, Wis.

One week after removal,
Winter 1988

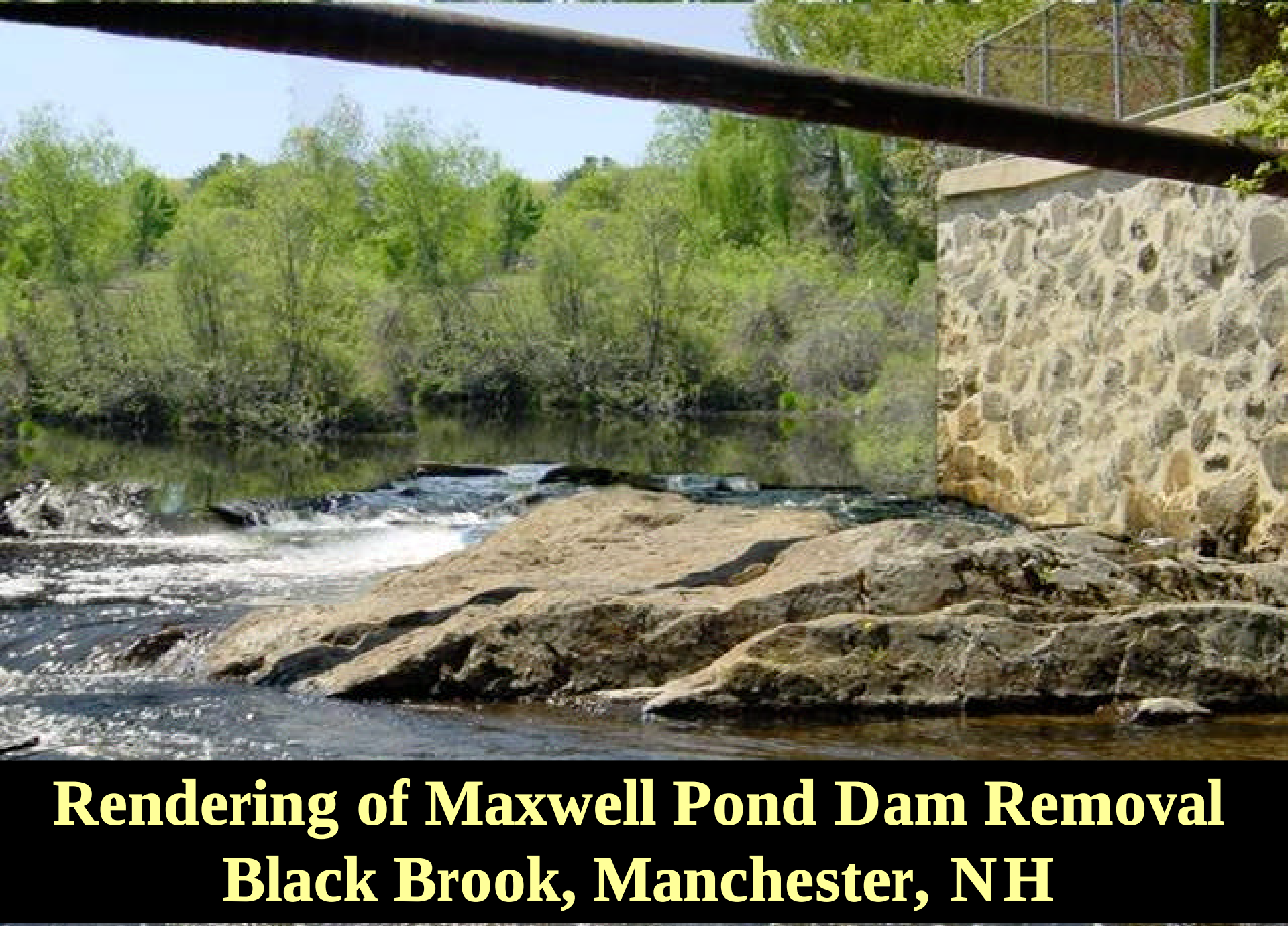
12 Years After Dam Removal





Riverside Park
Milwaukee River, West Bend, Wis.

Maxwell Pond Dam
Black Brook, Manchester, NH



Rendering of Maxwell Pond Dam Removal
Black Brook, Manchester, NH

Photo Rendering of Area Upstream of Maxwell Pond Dam

Fear: Loss of wetlands if dam is removed

Reality: The pond today is beginning to resemble a natural stream / wetland ecosystem like the photo below

Benefits of Maxwell Pond Dam Removal

- Dam no longer serves historical purpose (ice harvesting of the 1900's)
- Opportunity to restore 6 miles of anadromous fish habitat / Black Brook
- City-Owned Property
- Timing is Right
- Many Funding Opportunities – Cheaper Than Dam Maintenance or Repair
- Several Interested Parties

Project Partners

- Manchester Urban Ponds Restoration Program
- Manchester Conservation Commission
- Manchester Parks & Recreation
- NH Dept. of Environmental Services
- NH Fish & Game Dept.
- National Park Service
- Trout Unlimited
- Amoskeag Fishways

Decision-Making to Date

- Public Informational Meeting – 5/22/03
- Lands & Buildings Committee Meetings
  - 8/10/04
  - 11/15/04
- Public Informational Meeting – 1/20/05

Next Steps

- Lands & Buildings Committee Meeting
- Mayor & Board of Alderman

- **Question & Answer Session**
- **Public Comment Session**
- **Adjourn**